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By-Price, Harry A.

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The conversion of a limited-use, "white elephant" auditorium into an electronic classroom to be used as a flexible instructional space with numerous potentials for enrichment of learning via utilization of electromechanical aids. (FS)

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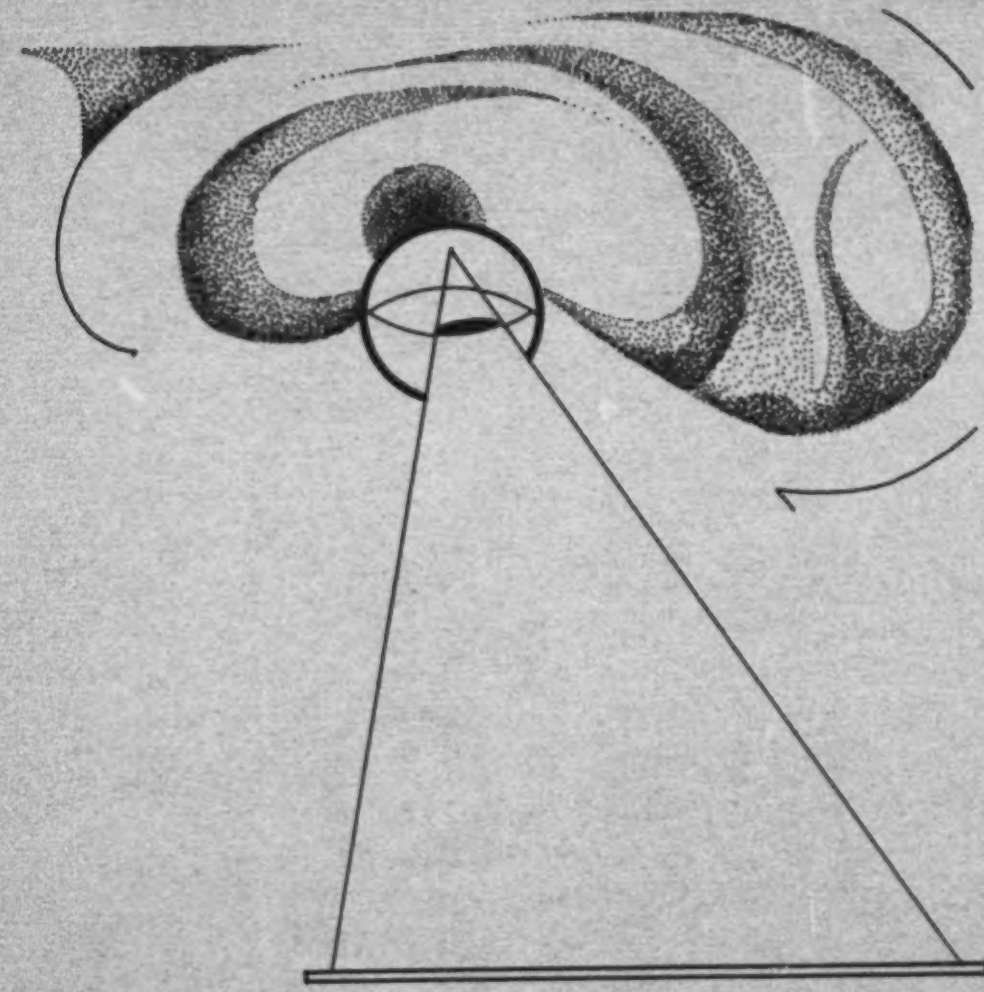

Electronic Classroom

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Cover by E. C. Bloem

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by

Harry A. Price

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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ELECTRONIC CLASSROOM

A "white elephant" auditorium, redesigned to meet the needs of the students now and in the future, has been transformed into truly useful space. This is the opinion of many of the Board of Education members and school personnel concerning the new "electronic classroom" in the Memorial Elementary School in Middletown, New York.

What do school officials do with a 450 seat auditorium that is used less than 10% of the school year, particularly when instructional space is needed? One solution is offered at the Memorial Elementary School — the product of the cooperative endeavors of the Board of Education, school officials and the Educational Facilities Laboratories.

The Memorial Elementary School is an intermediate school housing approximately 600 students. Built in the early 1920's, the school was a Junior High School until 1959, when it was converted into an elementary school. On the third floor existed a large auditorium of the flat floor variety with row upon row of theater-type seats (Illustration #1). This area was rarely used because of poor acoustics and inadequate lighting and ventilation. In reality, here was a hollow space in the midst of overcrowded instructional areas.

In recent years more emphasis has been given the auditorium as an instructional area where the most advantageous use can be made of TV and other audio-visual equipment. Colleges and high schools have incorporated, with apparent success, both the language laboratory and audio-visual equipment into one instructional area, most commonly referred to as an "electronic classroom." Why not the elementary school? This is the question we posed to Educational Facilities Laboratories, who in turn provided a grant to study the possibilities of developing the area described above into electronic teaching space. For almost a year research and data were compiled and studied. In January, 1965, renovation of the auditorium began. By September 1965, the Memorial Elementary School had in operation a 174 student-station electronic classroom designed for the maximum use of both language laboratory facilities and audio-visual equipment. There were also three areas at the back set up as resource centers for major curricular fields.

The auditorium was completely remodeled. The ceiling was lowered and new lighting with special controls was added. The walls were treated for sound and the total area was carpeted or, as we refer to it,

ILLUSTRATION No. 1: Before . . .

"acoustically tiled" (Illustration #2). The stage area was redesigned to provide for two rear-view projection facilities. Pivoting operable partitions permit it still to be used as a small stage when the need arises (Illustration #3). Special glass was installed on the window side of the auditorium to cut down on natural light. Specially designed student desks and teaching consoles were installed. In total, we endeavored to use the results of research in the remodeling of this area.

Although we have redesigned an old auditorium into an electronic classroom, we have not lost the use of the area for assembly purposes. The operable partitions which separate the electronic classroom from the resource centers fold into the ceiling. When they are opened an additional 100 to 130 students have direct sight to the stage area for lectures or general assemblies.

INSTRUCTIONAL AREA

The electronic instructional area is divided, without partitions, into three sections with a teaching console for each section (Illustration #4). The center area contains 52 student stations, while the sections to the right and left have 59 and 63 student desks respectively. The lighting for each section is controlled by a variable transformer so that

any degree of brightness may be achieved for that particular teaching area.

To avoid both permanent and operable partitions, a careful study was made of the sight lines from all areas within the electronic center. As a result the student desks on either side of the center section face toward the stage. Also each row in these two sections are angled so that sight lines are directed to that portion of the electronic center desired. The student positions in the center section face to the rear thus directing their sight lines to that portion of the electronic center.

Student positions consist of specially designed language laboratory convertible booths (Illustration #5). The electronic desk either opens into an independent booth for each student or closes into a table with unobstructed writing surface. Under each desk is a storage area for student books and materials. Each desk contains a headset consisting of earphones, a boom-mounted microphone and a volume control mounted on the right earpiece. Both the boom microphone and earphones adjust to the wearer's head (Illustration #6).

ILLUSTRATION No. 2: Carpeting . . .

ILLUSTRATION No. 3: Stage partitions . . .

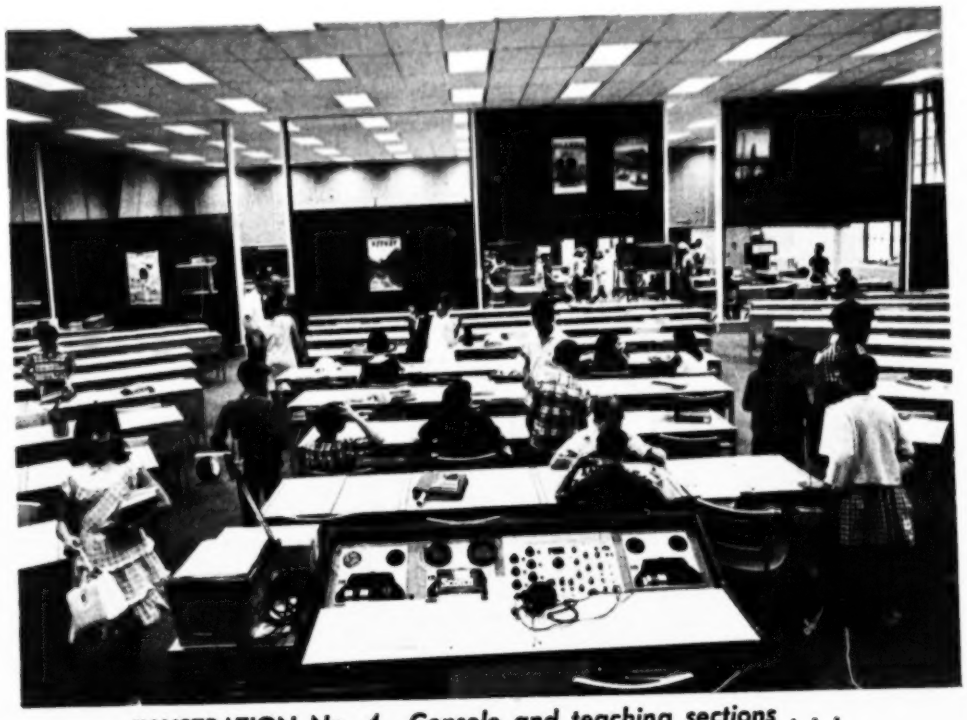

ILLUSTRATION No. 4: Console and teaching sections . . .

CONSOLES

Each instructional area is controlled by a permanently installed console containing lesson play-back mechanisms, a teacher-class intercommunication system, equipment for making tape recordings and a phonograph player. On the consoles to the left and right of the center console one tape recorder has been replaced by an automatic projector control panel. The control panels were specifically designed for the Memorial Elementary School by Sigma Electric Company, since no standard panel would adequately handle the unusual room layout. Extreme flexibility has been obtained in a control system that is also simple to operate.

Each console is capable of programing up to six different lessons simultaneously to the class in that particular instructional area. For example, rows one and two may be listening to a pre-recorded tape on one tape recorder, rows three and four, to another tape, while still another group may be listening to the teacher, or phonograph, or other auxiliary input, such as a radio. The instructor can also carry on a two-way conversation with any student in his group without interrupting the program going to the other students, or he can allow the entire class to hear any student's response.

The center section of the electronic classroom is the television instructional area (Illustration #7). Here the students face to the rear of the classroom where four 24" portable television sets are located. Although this is designated as the television area, the teacher's console has the same language laboratory facilities as do the other two consoles. This console is also the master console. When the program controls on the consoles to the left and right are pre-set, a program emanating from the center may be heard by all three classes (Illustration #8). The master console also features a special tape synchronizer for the recording of pulses on the lower track of a tape for subsequent automatic advance of a filmstrip or slides in step with the tape being played.

The left and right consoles of the language laboratory are equipped with a projector control panel. With this panel, it is possible for the instructor, while remaining seated at the console, to control the operation of three rear-view projectors previously set up. The projectors (a 16mm sound motion picture projector, a filmstrip machine and a slide projector), are located on a specially designed frame, directly behind the two consoles, at the rear of the stage (Illustration # 9). The audio-visual controls feature automatic focus control and reverse and forward switch for the slide and filmstrip projectors.

Through the use of the tape synchronizer, located on the center console, the instructor can program a tape to coincide with any film strip or series of slides. When using this lesson in the audio-visual instructional areas he is free to give individual help to those who need special attention.

INSTRUCTIONAL RESOURCE CENTERS

Through the use of operable partitions a rear portion of the auditorium has been separated from the electronic classroom and subdivided into three instructional resource centers. Library shelving has been used to separate these areas from each other. One area has been developed into a reading center where one will find electronic desks, special reading material and E. D. L. reading carrels. A second section has been designated the social studies center. It contains specialized wall maps, books and other materials. The third area has been made into a science/math center. Here are found a Sheldon math/science table plus additional equipment and materials. All areas are carpeted and have tables of various shapes, and chairs, rather than traditional school furniture.

These areas are as yet in their embryo stage, since we were compelled by necessity to use this portion of the auditorium as classroom space during our first year of operation. We envision these areas as resource centers where individuals or small groups may come independently to preview filmstrips and tapes, conduct experiments, and gather additional information from the materials housed here. The reading area will also be used for remedial instruction of small groups.

STORAGE AND PRODUCTION

Adjacent to the electronic classroom is the heart of the operation, the audio-visual storage and production room. Here staff members may find banks of tapes, film strips, transparencies and other audio-visual materials. Also located here are various machines for the production of transparencies and other materials. Presently we have been able to release one staff member on a part-time basis to coordinate the activities of the center, make transparencies and disperse audio-visual materials. He has also been able to hold small-group workshops with staff members at various times during the school year.

FUNCTIONAL USE OF CENTER

Prior to the opening of the center in September 1965 a two-week workshop was conducted in the electronic classroom under the direction of our high school audio-visual coordinator. Consultants were brought

ILLUSTRATION No. 5: Booths . . .

ILLUSTRATION No. 6: Headsets . . .

ILLUSTRATION No. 7: Television . . .

in not only to show how the equipment functions but also to illustrate techniques for using various media in teaching a lesson. Those attending had an opportunity to produce some materials of their own.

Since an electronic center of this scope has never been attempted at the elementary level, our first year of operation has been primarily a training period for both staff and students. Due to a shortage of instructional space in the school district the center serves as home base for three sixth-grade groups. Because of the particular organizational pattern presently being developed in the Middletown Schools we are able to schedule different groups in this area throughout the day; therefore, no one group remains within the center all day.

One must not get the preconceived idea that an electronic center of this size and type is audio-active constantly. One might walk in and find three classes being conducted simultaneously with the instructors giving a conventional lesson, showing a filmstrip or slides or using the overhead projector. In some instances one instructor may be working with as many as 100 to 150 students while the other staff members are planning or helping with small group instruction. One of the important advantages of this center has been flexibility. Open space has helped

make this possible. Not all instruction need be carried on in a "square box."

INITIAL EVALUATION

Since the first year of operation was primarily a training period rigorous evaluation was not attempted. We were interested in finding the answers to such questions as these: What are the limitations of the center? What effect does experience in the center have on teacher performance in the conventional classroom? What technical problems need to be solved?

No restrictions were placed on what subjects should be taught within the center. Teachers were encouraged to experiment with the whole spectrum of the curriculum, using a wide variety of materials that were available. Reading groups, regular, remedial and advanced, had opportunities to be programmed through the center. Social studies and science were taught here to groups of conventional class size and larger. English, math and music were other areas touched upon. The center became an experimental workshop for materials, media students and staff. The keynote of the year was innovation.

There were some apparent positive outgrowths of the center as we reviewed our first year of operations. Many staff members have be-

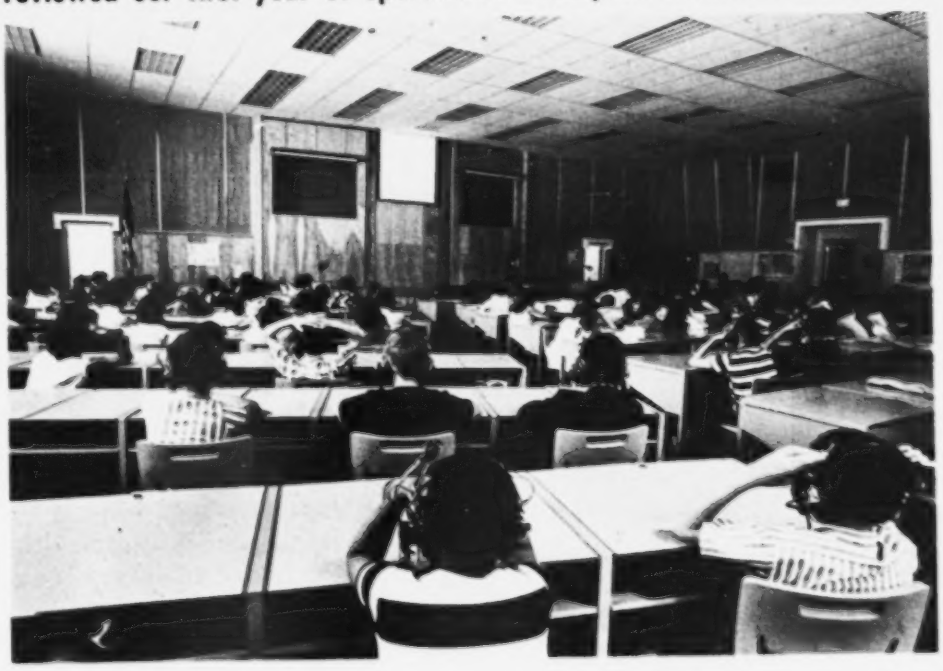

ILLUSTRATION No. 8: Large group instruction . . .

ILLUSTRATION No. 9: Behind the scenes . . .

come increasingly aware that audio-visual materials can add a new dimension in instructional quality to their teaching. Probably the greatest carryover to the classroom has been the use of transparencies. Teachers found that the overhead projector was often much more effective than the traditional blackboard. The use of tapes and records permitted students who had reading difficulties to share experiences that formerly could come only from the printed page. Pre-recorded programs offered students a greater variety of learning resources. Students themselves became proficient in operating the equipment and programming materials.

Although large-group instruction was more prevalent in social studies and science it was also tried out in math, English and music.

SUMMARY

The "electronic classroom" at Middletown's Memorial Elementary School has converted a limited-use auditorium into flexible instructional space with exciting potentialities for enrichment of learning. Aside from its effect on teaching-learning conducted within it, it has already influenced teacher behavior in the conventional classroom. While its use to date has by no means been unflawed, it holds rich promise for the future.

We commend this type of facility to the attention of other schools and school systems, especially if they have an existing auditorium which currently receives only minimal use.